Electronic Supporting Information for the Article:

Following Protein Kinase Acivity by Electrochemical Means and Contact Angle Measurements

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Materials

Dithiobis(succinimidyl propionate) was purchased from Sigma used as supplied. Casein kinase II and peptide (**1**) were purchased from New England BioLabs. Alkaline phosphatase was purchase from Sigma.

Modification of Electrodes with peptide (1)

Au wire electrodes (0.5 mm diameter, geometrical area ca. 0.16 cm^2, roughness factor ca. 1.4) were used in the experiments. Prior to modification, the electrodes were soaked in concentrated HNO_3 for 5 min, rinsed with water. Then the electrodes were rinsed again with boiling ethanol and water, dried with N_2. The Au electrodes were reacted in 1 mM dithiobis(succinimidyl propionate) in dry DMSO for 1 hour, rinsed with DMSO and then briefly with water. The active ester modified electrodes were further reacted with peptide (**1**) (0.1 mM , in 0.1 M HEPES buffer, pH=7.4) for 2 h, washed with water.

Phosphorylation and dephosphorylation of (1)-functionalized Electrodes

The peptide (**1**)-functionalized peptide modified electrodes were incubated in different concentrations of CK solution (20 mM Tris-HCl, 50 mM KCl, 10 mM $MgCl_2$ pH = 7.5). The dephosphorylation of the peptide (**1**) was achieved by incubation the phosphorylated peptide (**1**)-modified electrode in alkaline phosphatase (25 units, borate buffer, pH=9) for 20 min.

Electrochemical measurements

A conventional three-electrode cell, consisting of a modified Au wire working electrode, a glassy carbon auxiliary electrode isolated by a glass frit, and a saturated calomel reference electrode (SCE) connected to the working volume with a Luggin capillary, was used for the electrochemical measurement. All potentials are reported with respect to the SCE. The cell was placed in a ground Faraday cage. Square wave voltammetry were performed using an Autolab electrochemical system (Eco chemie, Netherlands). SWV measurements were taken at a frequency of 50 Hz in 50 mM HEPES solution (pH=7.2).

Contact angle measurements

Static contact-angle measurements were performed on the modified Au slides with a CAM 2000 Optical-Angle Analyzer (KSV Instruments, Finland). An approximately 20 μL droplet of the 0.05

M HEPES buffer solution with a diameter of roughly 0.5 cm was deposited on the surface from a syringe. The images of the droplets were recorded, and each contact-angle measurement was repeated for at least 3 times, and the reported value represents the average of these results.

Microgravimetric Measurements

A QCM analyzer (Fluke 164T multifunction counter, 1.3 Ghz, TCXO) was used for microgravimetric measurements. Quartz-crystals (AT-cut, 10 MHz) sandwiched between two Au-electrodes (geometrical area 0.2 cm^2, roughness factor ca. 3.5) were used. The Au electrodes were modified in the same way as described above for the Au wire electrodes. Frequency changes were measured in air after each modification step.